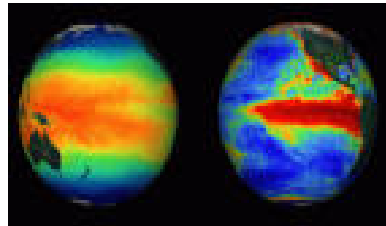



Sustainable Urban Energy Planning: *A Roadmap for Research*




Folsom Dam & Powerplant
Courtesy of U.S. Bureau of Reclamation



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- The California Energy Commission's **Public Interest Energy Research (PIER) Program** provides advanced energy innovations in hardware, software, systems, exploratory concepts, supporting knowledge, and balanced portfolio of near, mid, long-term energy options for a sustainable energy future in California

Sustainable Urban Energy Planning Definition



Sustainable Urban Energy Planning

Activities that promote the efficient use of energy resources in the development of economically, socially, and environmentally healthy communities

Local governments are important stakeholders in CA energy future

- Most State energy use occurs within urban areas or in support of their populations and economies
- Urbanized land in CA's 36 most urban counties is expected to increase over 25% in the next 20 years
- California's population is expected to grow from 35 million today to 55 million by 2050

Local governments can have an important influence

Local governments can:

- Promote land-use planning that supports smart growth;
- Support and influence energy efficiency and demand response;
- Promote building and development standards that exceed State efficiency standards; and
- Respond to local environmental concerns.



Sustainable Urban Energy Planning Roadmap Purpose


Chart out an agenda that identifies research areas designed to support and bolster local and regional governmental energy related planning efforts

The Premise for a SUEP Research Program

- Technological advances are providing opportunities for effective new approaches to energy management
- Regulatory changes are creating a new landscape for local government involvement in energy markets
- The inherent attributes of local government provide opportunities to fill gaps left by Federal, State, and IOU roles
- Public concern about environmental quality and energy is leading local governments to undertake a variety of energy related activities




Major Research Goals Identified in SUEP Roadmap

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- Develop a better understanding of the embedded environmental and operational energy needs of urban infrastructure systems and urbanization
 - Identify and demonstrate environmental, economic, and equity benefits of local energy planning activities, particularly with respect to the private sector
 - Develop information and materials that lead to a better understanding of local and regional sustainable urban energy planning options and practices
 - Develop effective decision support tools and methods for sustainable urban energy planning

SUEP Roadmap

Major Research Themes

- 
- Develop and incorporate life cycle analyses into process (e.g. water) models for basic services provided by local governments
 - Use of whole systems analyses (e.g. validation of energy indicators) to set and achieve energy sustainability goals
 - Continued development and testing of community planning models (i.e. I-PLACE³S)



Energy Module for I-PLACE³S

Issue: Regional groups responsible for transportation and land-use planning do not have readily available scientific tools to analyze energy concerns as part of the land-use planning process

Research: Energy Commission (PIER-EA) is funding a project to incorporate an energy module into I-PLACE³S

- Focuses on establishing a baseline for energy consumption in residential and commercial buildings
- Provides energy supply alternatives (distributed generation/renewables), efficiency and air quality analytical capability
- Pilot tests – SACOG/SMUD and SANDAG

Benefit: Tool will allow planners using I-PLACE³S to conduct energy analyses, providing more comprehensive planning activities that can include energy





Energy Commission support of Water Energy Sustainability Tool

Issue: For local jurisdictions, the water system may represent approximately 56% of its total energy use. In light of increasing demand for limited water supplies, local jurisdictions are faced with developing not only new sources of water, such as through desalination, but also through maximizing existing supplies through water conservation

Research: Energy Commission (PIER-EA) is funding the expanded analytical capacity of the Water Energy Sustainability Tool (WEST)

- Model will assess the life-cycle costs of the water system and various water supply options

Benefit: Tool for water utility managers to make better energy and environmental, water system related decisions





Energy Commission support of integrated energy & environmental modeling tools

Issue: Within the next 25 years, the U.S. will design and construct more than 213 billion ft² of new built space, presenting an opportunity to design and build to a new level of energy and resource efficiency.

Research: Energy Commission (PIER Buildings) is funding a project to look at more efficient site design in Chula Vista. The project will:

- Demonstrate the use of modeling tools to optimize energy, economic, and environmental parameters
- Analyze impacts of efficient community designs on utility infrastructure and identify solutions to institutional and market barriers
- Conduct stakeholder reviews and feasibility analyses

Benefit: Case studies and guidelines that describe ways to optimize energy and resource efficiency in site design





PIER-EA Contact Information

■ Program Manager:

- Kelly Birkinshaw
- (916) 654-4542
- kbirkins@energy.state.ca.us

■ Staff Lead:

- Gina Barkalow
- (916) 654-4057
- gbarkalo@energy.state.ca.us

